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SCIENCE.—SUPPLEMENT.

FRIDAY, OCTOBER 23, 1885.

PRICES FROM 1873 TO 1884.

IN the annual report issued by the mint department on the production of precious metals in 1884, there are given statistics of prices during the years 1883 and 1884. These statistics are in continuation of others of the same kind in previous reports. The figures for the years from 1825 to 1880 may be found in the quarterly report of the Bureau of statistics, No. 3, 1883-84; those for the years 1881 and 1882 in the report of the director of the mint for 1883; those for 1883 and 1884 in the present report. All of them, we are informed, were collected and arranged under the superintendence of Mr. Burchard, the former director of the mint, to whom belongs the credit for the work. The investigation is one which does not lie very obviously within the scope of the mint department, and recognition is due to the intelligence and activity which caused it to be undertaken.

The different reports, taken together, purport to give a continuous account of the fluctuations of general prices from 1825 to the present time. Such an account, if accurate and trustworthy, would be of great interest and value. Unfortunately the statistics have not been got together in a very careful way; and the general results which are deduced from them can be accepted only with liberal allowance for possible errors.

To the method adopted there can be little objection. It was to take the wholesale prices of a number of articles in New York, to reduce them to a common denominator, and then to calculate the arithmetical mean of the prices as reduced.

It can be easily illustrated by an example. Suppose that for three years the prices of cotton, wheat, and pig-iron, were as follows:

	1880.	1881.	1882.
Cotton.....	.10	.12	.08
Wheat.....	1.00	.80	1.50
Iron.....	20.00	30.00	40.00

Indicate the price of each article for the first year by 100, express the prices for the following years in percentages on that basis, and calculate the averages. The result is:

	1880.	1881.	1882.
Cotton.....	100	120	80
Wheat.....	100	80	150
Iron.....	100	150	200
Average.	100	116%	150

The average, or arithmetical mean, of the percentages here indicates a rise in prices over the average of 1880, of 16 $\frac{2}{3}$ per cent in 1881, and of 50 per cent in 1882.

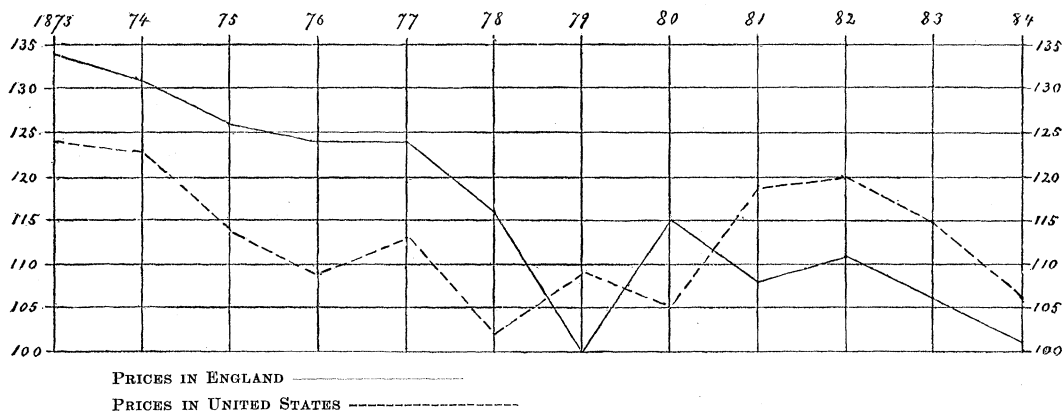
If the prices of a sufficiently large number of articles be taken, the averaged percentages indicate with sufficient accuracy the general rise or fall of prices. This is the method adopted in the mint reports; and it is also adopted in the *London economist's* annual table of prices. If applied with care, it is probably the safest way of calculating the rise and fall of general prices. Objections to it have been much urged, and other methods of calculation have been suggested and tried; but the various experiments seem to show pretty clearly that the simple arithmetical mean of the prices of a large number of articles gives as good an indication of the general fluctuations as we can hope to get.

Unfortunately the method has been applied with too little care and discrimination in the tables before us. In the first place, one cannot be sure that the prices quoted are the real market prices. For the years previous to 1873, they are taken bodily from two Treasury reports, those for 1863 and for 1873, in which tables of prices for a long series of years were brought together. There has always been a suspicion that these prices were largely made up by the clerks in the Treasury office, and that they were not worth much as a record of the real fluctuations. For the years after 1873, the figures were gathered specially for these mint reports, and may be more trustworthy. But even here there are obvious mistakes and inconsistencies. For instance, instead of taking the same articles consistently year by year, and deducing the average prices of these, the list changes almost every year. Thus for 1881 and 1882, the prices of 88 articles are given; in this year's report, however, for 1883 and 1884, those of 94 articles are taken. In other words, it is as if the prices of one set of articles for this year were compared with the prices of another set of articles for next year; a method which obviously, so far as the two sets vary, vitiates any comparison between them. It is part of the same error in these tables, that an article, after having been quoted and reckoned for a few years, suddenly disappears entirely, while another one perhaps takes its place, and is reckoned in the general average. One is therefore not surprised to find the results to be on their face inconsistent with each other. Thus the average

prices of 1884 are given as 92.2 per cent of those of 1883; yet side by side other figures are given which make the ratio 91 per cent.

Nevertheless, it would be going too far to say that the results are quite without value. A very large number of articles are included in the comparison, which gives a probability that the mistakes will balance each other, or will not appreciably affect the general results. It is not unreasonable to believe that the figures which are finally given as indicating the rise and fall of general prices for the successive years, although they cannot be accepted as an accurate gauge of the ascertainable change from any one year to the next year, yet represent fairly enough the general fluctuations of the series of years. They are at all events probably as good an index of the actual changes as the tables of the *London economist*, which have been much quoted and used. We reproduce the mint figures in the accompanying chart for the years since 1873, and for comparison give also the *Economist* figures, which indicate the course of prices in England. It should be said that, for both countries, the standard (indicated by the number 100) is the average range of prices of the years 1845-50. Those were the years just before the Australian and Californian gold discoveries, and the average for them has always been used by the *Economist* as the basis of comparison in its table of prices.

We have arranged the mint figures on the same basis, using for that purpose the figures for 1845-50 given in the earlier mint report. This method of comparison is of course open to objections, but seems on the whole to be the best:



The figures begin with 1873, a year of speculation and of inflated prices all over the world; and it will be seen that in both countries prices fell continuously during the long years of depression from 1873 to 1878. The fall in England was from

134 to 116; and in England there was in 1879 a still further fall to 100. That is, in 1879 prices in England had gone down to the level of the years 1845-50. In this country, the fall from 1873 to 1878 was from 124 to 102. The revival began here earlier than in England, and from 1878 to 1879 there was already a rise from 102 to 109. After 1879 the tendencies in both countries for a few years was to a rise. A temporary fall, it is true, is indicated in the United States from 1879 to 1880; but one cannot but look at this fall with suspicion, and ascribe it, at least in part, to some of the mistakes made in calculating the mint figures. In England the highest point since 1878, according to the *Economist*, was reached in 1880. But there are reasons, which there is not space to explain, for ascribing the high figure for that year to the peculiar methods of the *Economist*, and for believing that there was in reality but little fall in 1882 as compared with 1880. In the United States there was a fairly steady rise from 1878 to 1882. Since 1882 there has been a steady fall in both countries. Last year (1884) prices were at 101 in England, and at 106 in this country; in other words, notwithstanding the severe depression, they had not gone so low as the lowest points reached during the last period of depression in England in 1879, and in this country in 1878. F. W. TAUSSIG.

THE NEW PHILOLOGY.

THE new school of philology in Germany, of which Professor Brugmann is one of the ablest representatives, claims to be a legitimate advance

on its predecessors in the direction of scientific sobriety and precision. The older scholars from Bopp down to a few years ago, says Sievers (in his article on Indo-Germanic philology, in the *Encyclopædia Britannica*), had naturally occupied